

In some specialized cases sorption from an organic solvent may be encountered, such as in the design of a waste minimization system to remove a nonpolar organic solvent from a more polar one such as acetone. However, sorption phenomena between a sorbent and an aqueous solution of the contaminant (or sorbate) are most commonly encountered. Examples of these systems include groundwater, surface waters, aqueous wastes from industries, and aqueous wastes in storage tanks and drums.

Sorption is an equilibrium process in which three classes of sorption mechanisms have been described—electrostatic, physical, and chemical [5.5]. Some of the mechanisms are illustrated in Figure 5.1. Electrostatic mechanisms occur as the result of charged attractive forces associated with the sorbent and the sorbate. An example of electrostatic sorption is the partitioning of heavy metals onto negatively charged hydrous iron oxides (e.g., $\alpha = \text{FeOOH}$) in soils. The most important sorbate property related to electrostatic sorption is the charge of the species [5.7]. For example, Fe^{3+}

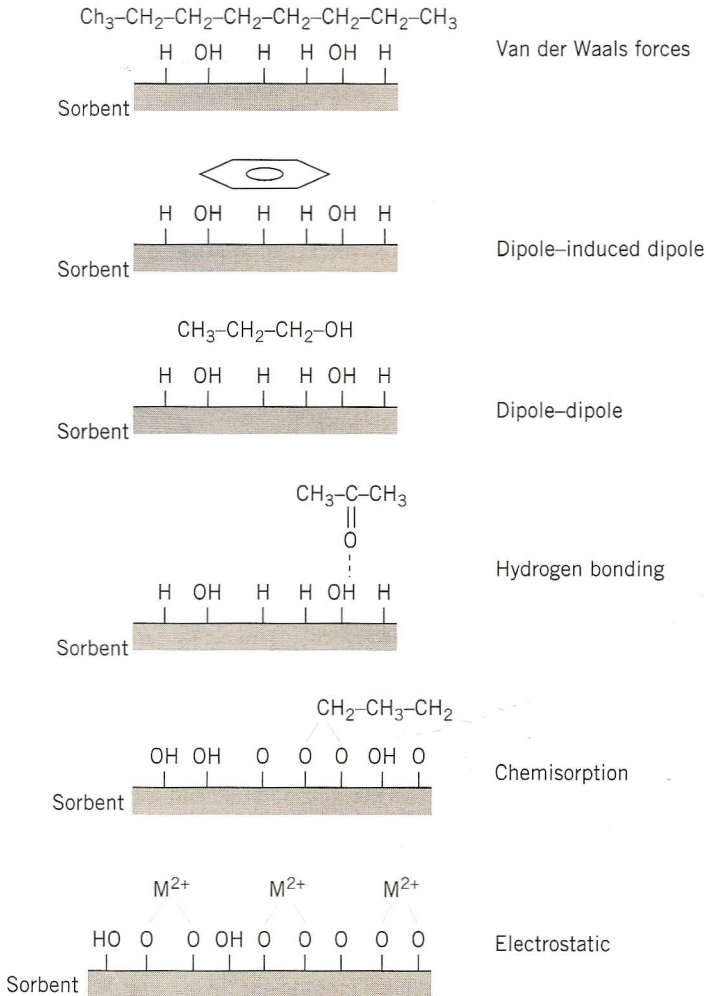


Figure 5.1 Mechanisms of sorption and partitioning. Source: Reference 5.6.